

REMARKS

Applicants have carefully reviewed the Examiner's Office Action dated May 29, 2003. In view of the above amendments made to the claims and for the reasons provided below, early allowance of pending claims 1 to 9 is respectfully requested.

I. As to the Claim Objection

In compliance with the Examiner's objection, the applicants have rectified the typographical error "promotor" to --promoter-- in claim 2, by way of the above amendment.

II. As to the 112(b) Rejection

With regard to the Examiner's 112(b) rejection, the applicants have properly amended claims 3 and 8 by way of deleting the phrase "needle-like" from claim 3 and replacing "the reducing reaction" with --the reduction of the metal ion-- in claim 8. In this regard, claim 5 on which claim 8 depends has been also amended to clarify the reduction of the metal ion in the cavity of nanotube, thus forming a nanowire.

Accordingly, it is believed that the above rejection has been overcome.

III. As to the 102(b) Rejection

The Examiner has rejected claims 4 and 9 under 35 U.S.C. 102(b) as being anticipated by Japanese Patent No. 11-246551 and Moskovits et al. (USP 5,581,091), respectively.

In this connection, the Examiner's kind attention is respectfully invited to the fact

that claim 4 has been amended to specifically define the component of the organic nanotube as calix[4]hydroquinone(CHQ), and claim 9 has been amended to more clearly define the nanowire to have a diameter of 1 nm or less, which amendments are fully supported by the disclosure of the specification as originally filed (see page 4, lines 11 to 17; and page 5, line 29).

In contrast, the Japanese patent is directed to a calixarene compound having a carbon nanotube-like tubular structure (see abstract), and the Moskovits patent discloses micropores having a diameter of about 1 to 500 nm (see abstract).

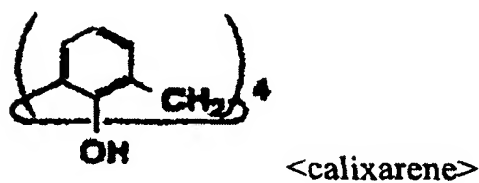
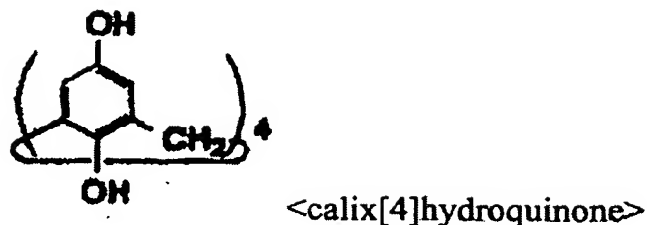
Accordingly, it is clear that the cited Japanese patent and the Moskovits patents do not teach the inventive nanotube and nonowire recited in claims 1 and 9, and therefore, it is believed that the Examiner's 102 rejections have been overcome and should be withdrawn.

IV. As to the 103(a) Rejection

The Examiner has rejected claims 1 and 3 as being unpatentable over JP 11-246551.

In this regard, the Examiner's kind attention is invited to the fact that the present invention and the JP patent are entirely different in terms of the starting materials and the procedure for the preparation of a nanotube.

Specifically, as mentioned above, the present invention employs a calix[4]hydroquinone(CHQ) as a starting material, whereas the JP patent uses, a calixarene, as shown in the following respective structures.



Due to the difference in the component of the starting material, the process and the principle for the production of a nanotube according to the present invention are naturally different from those of the JP patent.

Specifically, in the present invention, CHQ is dissolved in an aqueous acetone solution, and then the crystallization is conducted at an ambient temperature range of 0 to 20 °C to form a nanotube by way of self-assembling CHQ via a hydrogen bond. The inventive CHQ organic nanotube comprises an infinitely long one-dimensional hydrogen bond array composed of hydroxyl group of CHQ and water molecules introduced by the aqueous acetone solution (see the disclosure of page 4, lines 14 to 17 of the present specification).

However, in the JP patent, calixarene is polycondensed in an organic solvent such as toluene (with no water) in the presence of a metal salt catalyst at a high temperature from 75 to 180 °C to form a nanotube. The nanotube of the JP patent is

formed by covalently bonding the hydroxyl groups of calixarene.

According to the present invention, the hydroquinone moiety of the nanotube can function as a powerful reducing agent and form charge-transfer complexes with electron-deficient molecules and metal ions (see page 4, lines 19 to 23 of the present specification). That is, the inventive CHQ nanotube formed by the hydrogen bond can be beneficially used in the preparation of a nanowire unlike the nanotube prepared by the JP patent.

Therefore, it is believed that the JP patent fails to teach, suggest or even imply the technical feature and the beneficial effect of the present invention, and thus, it does not render the present invention obvious.

V. Miscellaneous

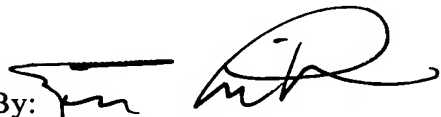
Applicants have amended the phrase "0 to 10 °C" appearing on page 2, line 3 to -- 0 to 20 °C --, which is fully supported by the disclosure of page 4, lines 1-2 and claim 1; and amended the paragraph appearing on page 3, lines 24 to 27 properly, which is intended to correct the obvious typographical errors.

CONCLUSION

In view of the foregoing amendments and discussions, it is respectfully submitted that the present invention as defined in pending claims 1 to 9 is in full compliance with all the statutory requirements and, therefore, it is earnestly requested that the Examiner's objections and rejections be withdrawn and that the pending claims be allowed in their present form.

Respectfully submitted,

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CERTIFICATE OF MAILING

I hereby certify that this AMENDMENT is being deposited with the U.S. Postal Service as First Class Mail in an envelope addressed to: Mail Stop: Non Fee Amendment, Commissioner for Patents, PO Box 1450, Alexandria, VA 22313-1450 on August 29, 2003.


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